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Remarks:

Applicant appreciates the Examiner's allowance of claims 15 and 18-21 as well as his consideration of the amendments and evidence presented by the Applicant.

In the April 13 Office Action, claims were rejected on the basis that the language about the balls being free to shift circumferentially is not supported by the specification. While it is true that the drawings do not show that, in the event of a puncture, the balls would move circumferentially, such movement is inherent in the embodiments that were shown and described in the original application and therefore does not constitute new matter. The description of the manner in which the balls are installed is on page 11, beginning on line 20. It simply says that the inflated balls are put into the tire and the edge of the tire is worked into position using a tire spoon and a plurality of clamps. There is no suggestion that any adhesive or anything else is inserted that would prevent the balls from moving independently in a circumferential direction within the tire. On page 4, line 12, the specification states, **"A rim lock may be used to help hold the tire bead onto the rim and to help prevent shifting of the balls during operation of the tire."** This suggests that the balls are free to shift circumferentially in the absence of the rim lock wedging between them, and, in the event that a ball is punctured and deflates, the remaining balls would be free to shift, even with the rim lock present. On page 9, line 10, the specification states, **"The rim lock 22 also wedges between two of the adjacent balls 18, tending to keep the balls 18 in their proper positions."** Again, this indicates that the balls are free to shift circumferentially and will shift if one of the balls is punctured and deflates. Since the circumferential shifting is inherent in the embodiments that were shown and described in the original application, it is not new subject matter and should not be the basis for a "new matter" rejection.

The language "at least some of", indicating that at least some of the balls are free to shift circumferentially, is supported by the specification, where all of the balls are free to shift circumferentially. While it is preferred that all the balls should be free to shift in order to help support the tire in the event that a ball is punctured, and while such an arrangement is the case in the embodiments that are shown and described in the application, it is conceivable that rim locks could be put on both sides of a ball, preventing that particular ball from being able to shift circumferentially, or that something else might be done to prevent some of the balls from shifting, and that should not take the arrangement outside of the scope of the claims, since it is not necessary for all the balls to be able shift in order to distinguish from the prior art arrangements, such as Grubb, in which none of the balls are free to shift circumferentially. It is not necessary for the disclosure to show one or more balls being restricted from movement in order to support the "at least some of" claim language, since, any time all the balls can shift, it is also true that at least some of the balls can shift.

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The Office Action also states that there is no support in the specification to exclude a component that is more rigid than the balls, as recited in claim 22. In a discussion with the Examiner, he indicated that such a negative limitation is not proper. In Ex Parte Parks, 30 USPQ2d 1234, PTO Board of Appeals 1993, there was a claim to a method for determining the chemically combined nitrogen content of a sample in the absence of a catalyst, which was a negative limitation. The Board said, "**In rejecting a claim under the first paragraph of 35 U.S.C. 112 for lack of adequate descriptive support, it is incumbent upon the examiner to establish that the originally-filed disclosure would not have reasonably conveyed to one having ordinary skill in the art that an appellant had possession of the now claimed subject matter....Adequate description under the first paragraph of 35 U.S.C. 112 does not require literal support for the claimed invention.**" In that case, the appellants were found to have possession of the concept of conducting the step in the absence of a catalyst, because the description did not mention the use of a catalyst, it would have been expected that a catalyst would have been mentioned in the description if it had been used, and it would have been reasonable to expect that one of ordinary skill in the art knew that the reaction generating nitric oxide is conducted without a catalyst.

The situation in Parks is very similar to the current situation, in which nothing more rigid than the balls extends radially to span the space formed by the tire and rim. If there were something more rigid than the balls spanning that space, one would expect that it would have been mentioned in the description and would have been shown in the drawings, since it would have a substantial effect on the quality of ride provided by the tire. The only element in the hollow space that is more rigid than the balls is the rim lock, and it does not extend radially to fill the space. It simply extends in a direction parallel to the axis of the tire in order to lock the edges of the tire in place on the rim. Thus, it is clear that the inventor in this case had possession of the concept of providing a tire in which nothing more rigid than the balls extends radially to span the space, which means that the disclosure is sufficient to support such a claim. Also, the case of In re Wakefield and Foster, 636 USPQ 164, CCPA 1970, makes it clear that negative limitations do not make a claim indefinite as long as the scope of the claims is clear. The scope of claim 22 is clear, so the claim should not be rejected for indefiniteness.

In this amendment, language has been added to the specification to describe the fact that, while there may be a rim lock and air within the space, in addition to the balls, the rim lock does not extend radially to span the space, and the air, which does extend radially to span the space is less rigid than the balls, so the balls are the most rigid elements that extend radially to span the hollow space. This does not add new matter, since the rim lock has already been described and is well-known in the art, and the air also was described and is inherently less rigid than the balls. Since the inventor clearly had possession of the claimed invention, and since the claim is clear, there should be no basis for rejecting the claim under Section 112.

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Referring now to the claims individually:

Claim 1 now defines an invention that is both novel and unobvious in view of the prior art. The tires of Peck and Grubb confine the balls so they are not free to move in a circumferential direction as claimed. The tire of Krum has "inflatable elements C comprising a hollow member having relatively flat and stiff end members c". These stiff end members are more rigid than the balls and actually deform the balls so that the balls become deformed into little cylinders. They also extend radially to span the space. Thus, the invention recited in claim 1 is distinguished from Krum. It should be noted that when members that are more rigid than the balls extend radially to span the space between the tire and rim, as in Krum, they have a negative effect on the quality of the ride provided by the tire, producing a "bump" every time one of the stiff members rotates to the bottom position. The claimed combination, of a tire with balls that extend radially to span the space, that are free to move circumferentially, and that are the most rigid members that extend radially to span the space, is not taught or suggested by the art. Thus, claim 1 should now be allowed.

Claim 2 adds the limitation of a main valve extending through the rim to permit gas to be inserted into and removed from the hollow space through the main valve.

Claims 3 and 4 add the limitation that at least one of the balls has its own valve.

Claim 5 adds a rim lock.

Claim 6 recites that there are lower pressure balls and higher pressure balls that are arranged in a repeating pattern in order to create an effect similar to providing knobs on the tire. While prior art balls must have had some random deviation in their pressures, simply due to the fact that it is impossible to make all the pressures exactly the same, the prior art does not teach an arrangement that provides lower pressure and higher pressure balls in a repeating pattern as claimed. The use of the "repeating pattern" in the claim does not add new matter, because the specification states, on page 13, beginning on line 5, that the balls could be inflated **"to different pressures, for example, alternating from a higher pressure in one ball to a lower pressure in the next adjacent ball, back to a higher pressure in the next ball, and so forth."** Thus, the specification gives an example of one type of repeating pattern, providing support for claiming the arrangement of the balls in a repeating pattern, which distinguishes from a random pattern that would have existed in the prior art. Of course, the phrase "repeating pattern" encompasses other repeating patterns in addition to the example taught in the specification.

Claim 7 depends from claim 1 and adds an inflatable tube.

Claim 8 depends from claim 1 and adds that the balls are made of polyurethane sheets that are welded together and in which the balls include individual valves.

Claim 9 is an independent claim. It has been amended to remove the word "thin", which the Examiner says provides no qualitative distinction. It has also been amended to

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require the balls to be arranged with varying pressures in a repeating pattern. This combination has not been taught or suggested in the prior art, where any variation in pressures was simply random.

Claim 10 recites that the balls are made of welded together sheets. This is a "product by process" claim, which is an acceptable form of claim and distinguishes the claimed invention from balls made from other methods. It also recites an invention that is both novel and unobvious in view of the prior art.

Claim 11 recites that the sheets are made of polyurethane.

9. Claim 12 has been canceled, as its subject matter has been incorporated into claim

Claim 13 adds a rim lock.

Claim 14 adds an inflatable tube.

Claim 15 has been allowed.

Claim 16 depends from claim 9 and includes limitations on the load carrying and tensile and elastic limits of the balls as well as the wall thickness of the balls.

Claim 17 depends from claim 1 and includes limitations to the material and the process for making the balls.

Claims 18-21 have been allowed.

Claim 22 has been amended to make it clear that the balls extend radially to span the space between the tire and the rim and that there is nothing more rigid than the balls that also extends radially to span the space between the rim and the tire. The space between the rim and the tire is a radially-oriented space, and requiring the balls to extend radially in order to span the space simply makes it clear that there is only a single layer of balls between the tire and rim. In a telephone conference, the Examiner said that the rim lock, which is more rigid than the balls, also spans the space. Thus, this amendment was made in order to make it clear that the rim lock does not extend radially to span the space, and this claim would be infringed whether or not a rim lock is present. This claim defines an invention that is both novel and unobvious over the prior art, distinguishing over Peck and Grubb, where the balls are not free to move circumferentially, and over Krum, where there are elements more rigid than the balls that radially span the space.

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Since all the claims now recite an invention that is both novel and unobvious in view of the prior art, Applicant respectfully requests allowance of all the pending claims.

Respectfully submitted,



Theresa Fritz Camoriano

Reg. No. 30,038

Camoriano and Associates

8225 Shelbyville Road

Louisville KY 40222

phone 502-423-9850

fax 502-426-1167